angle on the outer surface of said moving pipe length, and

(c) heating means which causes thermal bonding to be continuously formed between the applied reinforcement fiber wraps and the outer surface of the moving pipe length.

32. (Once Amended) The apparatus of claim 26 wherein the individual fiber wraps are aligned at different spatial angles.

REMARKS

All claims 1-34 in the subject application have been amended in a manner to hopefully avoid further rejection for indefiniteness under 35USC112 as well as still further rejection based on the cited references under both 35USC102 and 35USC103. With respect to said 35USC112 rejection, all amended claims now recite "spatial angle" for "spatial direction" as well as now recite "hoop angle" for "hoop direction" and with both of said latter terms having the well accepted meaning defined in United States Patent 6,164,702 and elsewhere.

A restriction requirement also appearing in the outstanding Office Action is respectfully traversed by the applicant. Said requirement is apparently based upon a conclusion reached by the Examiner that product-by-process claims 1-10 can be "made" by materially different means than recited in the method claims 11-24, such as having the pipe kept stationary while wrapping the fibers around the stationary pipe. The applicant cannot agree with such conclusion since keeping a given length pipe member stationary necessarily requires continuous movement of the fiber wrapping means to apply fiber over its length including its movement in the opposite direction for multiple fiber wraps. Understandably, such movement of the fiber wrapping means is contrary to a requirement recited in all of the present method claims for having the fiber reinforcement being applied in a distinctly opposite manner which can all be conducted without interruption during a single

continuous operation. Keeping the pipe member stationary as proposed by the Examiner could also further entail rotation of said pipe member while applying the fiber wrap. Such procedure is again contrary to a requirement in all now amended process claims for linear pipe movement "without rotation" when said reinforcement fiber is being applied. The now claimed product should also be deemed unobviously different from prior art products reinforced as proposed by the Examiner. As now claimed, thermoplastic pipe members of any length can be continuously reinforced in the claimed manner as distinct from reinforcing a fixed length pipe member. The claimed product can so be reinforced with multiple fiber wraps in a single continuous operation without having to reverse the direction of fiber winding as required when a finite length pipe member is kept stationary or rotated in place. Providing multiple fiber wraps having different fiber angles as depicted in the applicant's drawings can thereby produce superior reinforcement characteristics in the final product. The applicant further respectfully traverses the requirement for restriction between said product-by-process claims 1-10 and remaining apparatus claims 25-34 in the subject application. All said apparatus claims again require continuous movement of the pipe member "without rotation in a linear travel direction" as distinct from having a fixed length pipe member kept in place as proposed by the Examiner. Said now amended apparatus claims further require "rotating fiber supply means" to continuously "apply a plurality of juxtapositioned reinforcement fiber wraps" about the circumference of said moving pipe member again as distinct from having to reverse the direction of fiber winding when a finite pipe member is kept stationary or rotated in place to do so. Based on such distinctions for reinforcement of a stationary pipe member as proposed by the Examiner, it is respectfully submitted that all claims 1-34 in the subject application do not merit restriction under 35USC121.

In view of an earlier provisional election made by the undersigned attorney on behalf of the applicant, however, all said method and apparatus claims 11-34 remain presently withdrawn from further consideration by the Examiner pending the requested reconsideration.

Elected product-by-process claims 1-6 stand rejected under 35USC102(b) as regarded by the Examiner to be anticipated by Abdullow (USP4,431,034). Said reference discloses a dissimilar product than now claimed by the present applicant in several critical respects. First of all, the only hose member being reinforced in said reference is made of "rubber" rather than a "thermoplastic organic polymer" as required in the now claimed final product. Secondly, there is no "thermal bonding" of the reinforcement fiber to the outer surface of said hose member in this reference by reason of having a non-metallic fabric interlayer "10" placed between said hose member and the reinforcement fiber. Additionally, the applicant's final product is formed in an entirely distinctive manner than is obviously suggested in a reference failing to describe how the disclosed hose construction is made. The skilled artisan can only speculate from reading said reference that making such reinforced hose member entails a sequence of discontinuous and separate procedures possibly further requiring relocation of the hose member between individual processing steps. As distinct therefrom, a continuous procedure is herein employed to form the now claimed final product requiring the pipe length to be moving "without rotation in a linear direction" during all processing steps. Such improved manner of continuous processing thereby provides many well recognized benefits not attainable with discontinuous product manufacture while further resulting in a novel and distinctive product for the reasons already above pointed out.

Elected product-by-process claims 1-6 stand further rejected under 35 USC102(b) as again regarded by the Examiner to be anticipated by Keister

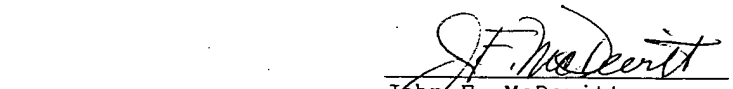
(USP4,343,333). The applicant cannot agree with such ground of rejection by reason of structural differences existing in Keister's product from that found in the now claimed article. The Examiner apparently relies on Table I in said reference as the basis for such rejection but a reading of said table by the applicant finds only that the fiber reinforcement is bonded to the core tube other than required in the now claimed product. Specifically, Keister employs "solvation" together with "extruded polymeric adhesive" as the disclosed means for bonding as distinct from a "thermal bonding" of the reinforcement fibers "to the outer surface of the pipe length". There also cannot be found in Keister any obvious suggestion for a specific method to make the disclosed product. Accordingly, it follows therefrom that a skilled artisan would not reasonably suspect that the presently claimed reinforcement procedure can be entirely carried out in a single continuous operation. Such distinctions understandably provide a novel and improved means of reinforcing continuous pipe lengths not obviously suggested in Keister.

Elected product-by-process claims 7-10 stand rejected under 35USC103(a) as regarded by the Examiner to be unpatentable over these same references. The apparent basis for such rejection is said to be obviousness residing in having short pipes "connected end to end later for storage and transportation of the pipe before use". Said ground of rejection is respectfully deemed in error since the rejected claims require the pipe lengths to be joined together "at the ends" when being reinforced as presently claimed. Accordingly, it is only after joinder that the "joined pipe lengths" are continuously fiber reinforced while moving "without rotation" in a linear direction" as understandably distinct from having already reinforced individual pipe lengths only "later" being joined together. It is thereby respectfully submitted that all said claims patentably distinguish in a still further manner from both references wherein

reinforcement of the claimed article itself is not found to be obviously suggested.

In view of the claim amendments herein made and the foregoing remarks, it is respectfully urged that an allowance of all presently amended claims be granted. An appendix hereto presents the specific amendments made in the revised claims. There is further enclosed for the Examiner's information a copy of the Petition filed concurrently with the present response under 37 C.F.R.1.102. Said petition seeks examination by the present Examiner at this time of a co-pending application Serial No. 09/726,252 entitled "Method to Reinforce thin Wall thermoplastic Storage Vessels" and filed in the same of the same inventor. This later filed application was filed November 30, 2000 and now includes product, method and apparatus claims which may overlap with claims contained in the present application. Consideration of both said pending applications by the same Examiner will ensure a more uniform treatment of the subject matter claimed therein as well hopefully expedite examination of both applications.

Respectfully submitted,



John F. McDevitt
Patent Attorney
Reg. No. 19,140

2255 Par Lane #626
Willoughby Hills, OH 44094
440/585-0919
June 2, 2001

CERTIFICATE OF MAILING

I HEREBY CERTIFY that this Amendment A is being deposited with the United States Postal Service as first class mail in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231 on this 2nd day of June 2001.

John F. McDevitt
Patent Attorney
Reg. No. 19,140

APPENDIX

(Once Amended) A fiber reinforced pipe length formed of a solid thermoplastic organic polymer with inner and out surfaces having a plurality of continuous juxtapositioned reinforcement fibers formed with a solid material composition selected from the group consisting of ceramics, metals, carbon, and organic polymers which are thermally bonded to the outer surface of said pipe [in] at a predetermined spatial [direction] angle with respect thereto, said reinforcement fibers having been continuously wrapped about the outer surface of said pipe length in an unbonded condition while said pipe length is continuously moving without rotation in a linear direction with respect thereto and followed by sufficient heating of the fiber wrapped pipe lengths to cause thermal bonding therebetween while the pipe length continues movement in the same linear direction.

3. (Once Amended) The fiber reinforced pipe length of claim 1 wherein the reinforcement fibers are wrapped [in] at the hoop [direction] angle.

6. (Once Amended) the fiber reinforced pipe length of claim 2 wherein the individual fiber wraps are aligned [in] at different spatial [directions] angles.

7. (Once Amended) A plurality identical fiber reinforced pipe lengths joined together at the ends and each form of the same solid thermoplastic organic polymer with inner and outer surfaces, said joined pipe lengths having a plurality of continuous juxtapositioned reinforcement fibers formed with a solid material composition selected from the group consisting of ceramics, metals, carbon and organic polymers which are thermally bonded to the outer surface of each joined pipe length [in] at a predetermined spatial [direction] angle

(b) wrapping a plurality of continuous juxtapositioned reinforcement fibers formed with a solid material composition selected from the group consisting of ceramics, metals, carbon and organic polymers while in an unbonded condition about the outer surface of each moving joined pipe length [in] at a predetermined spatial [direction] angle, and

(c) heating the fiber wrapped pipe lengths sufficiently to cause thermal bonding between the reinforcement fibers and the pipe lengths while said joined pipe lengths continue to move in the same linear direction.

25. (Once amended) an apparatus for reinforcement of a pipe length with inner and outer surfaces and formed with a solid thermoplastic organic polymer which includes:

(a) pipe feeding means which continuously transports the pipe length without rotation in a linear travel direction for operative association with rotating fiber supply means,

(b) fiber supply means which rotate about the circumference of said moving pipe length to continuously apply a plurality of juxtapositioned reinforcement fiber wraps [in] at a predetermined spatial [direction] angle on the outer surface of said moving pipe length, and

(c) heating means which causes thermal bonding to be continuously formed between the applied reinforcement fiber warps and the outer surface of the moving pipe length.

32. (Once Amended) the apparatus of claim 26 wherein the individual fiber wraps are aligned [in] at different spatial [directions] angles.